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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/773,708

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Mauricio Huerta Alva

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EXAMINER

PEIKARI, BEHZAD

ART UNIT

PAPER NUMBER

2189

DATE MAILED: 08/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/773,708

Applicant(s)

ALVA ET AL.

Examiner

B. James Peikari

Art Unit

2189

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 26 May 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,2,4,5,7-14,16,17 and 19-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,5,7-14,16,17 and 19-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 February 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to because the view numbers are not in accordance with 37 CFR 1.84(u)(1). For example, "FIG. 1" should replace "Fig. 1". Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Specification***

2. The specification is objected to because the title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed, including such features as MRAM and error correction.
3. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

***Claim Rejections - 35 USC § 102***

4. The previous rejections under 35 U.S.C. 102(b) are withdrawn due to the amendment filed on May 26, 2006.

***Claim Rejections - 35 USC § 103***

5. The previous rejections under 35 U.S.C. 103(a) are withdrawn due to the amendment filed on May 26, 2006.
6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 1-2, 4-5, 7-14, 16-17 and 19-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Desikan reference (hereinafter "Desikan") in view of DeBrosse et al., U.S. 6,704,230.

Desikan discloses a system that comprises a magneto-resistive random access memory (MRAM, *note Figure 3*) coupled to a volatile cache memory (*note that the cache may be either SRAM, as in Figure 3, or DRAM, note page 14, first paragraph*) comprising: receiving a request from a controller to read data from the MRAM (*note Desikan, Section 3.1*); determining if the requested data is located in the cache (*note Desikan, Section 3.1*); passing the data from the MRAM to the cache if the data is not located in the cache (*note Desikan, Section 3.1*); and passing the data to the controller from the cache (*note Desikan, Section 3.1*). Desikan further discloses decoders (*Figure 3*) for decoding (translating) requests received at the request buffer (*Figure 3*) so that the MRAM is accessed using physical addresses (*Page 6, Page Placement Policy*). Desikan further discloses the claimed virtual memory controller (*note Figure 3, "Bank*

*Controller*). Desikan further discloses that a portion of the MRAM comprises a page file (*Desikan, Page Placement Policy*).

Desikan does not teach error correction circuitry (ECC) for the MRAM and fabricated on the same substrate as the MRAM, however to use ECC with memory was well known in data processing systems. DeBrosse et al. teach just such an example of the benefits of using ECC with MRAM. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have error correction circuitry associated with the MRAM of Desikan, in the manner of DeBrosse et al., since such a combination would have (1) preserved data integrity (*note DeBrosse et al., column 3, line 5*) and (2) lowered switching currents (*note DeBrosse et al., column 3, lines 48-50*) to reduce power consumption.

As for fabricating the ECC of DeBrosse et al. on the same substrate as the MRAM and decoder of Desikan, note that the MRAM and the decoder are fabricated on a single semiconductor substrate (*Desikan, Page 8, Baseline MRAM System*). As for fabricating the ECC on the same substrate, this was not taught, however Desikan noted the importance of reducing distance to decrease latency (*note Section 3.2*). It would have been obvious to have the ECC of DeBrosse et al. on the same substrate as the MRAM of Desikan since: (1) Desikan explicitly mentioned the benefits of fabricating elements on the same die (*note page 14*), (2) this would have decreased the distance between the two, which would have decreased the latency, which would be necessary to achieve high performance (*see Desikan, Section 3.2*) and (3) to make integral is generally not given patentable weight to make integral is generally not given patentable

weight, In re Larson 144 USPQ 347 (CCPA 1965); note that this decision was later upheld for electrical circuitry, In re Tomoyuki Kohno 157 USPQ 275 (CCPA 1968).

8. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Desikan/DeBrosse et al. combination described above, and further in view of Vaidya (US Pub No 2004/0225843).

(A) As per claim 7, Desikan and Microsoft disclose the memory device of claim 1, Desikan and Microsoft do not disclose the memory device wherein the cache comprises one of a unified cache and a segmented cache.

Vaidya discloses a memory device wherein the cache comprises one of a unified cache and a segmented cache (Fig 1, Ref 20, 22; Paragraph 15)

(B) As per claim 8, Desikan, Microsoft and Vaidya disclose the memory device of claim 7, wherein the segmented cache comprises a data segment and an instructions segment (Fig 1, Ref 20, 22; Paragraph 15).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the segmented cache of Vaidya into the Desikan/DeBrosse et al. combination described above, since this would allow for that an instruction may be read and a load or store operation performed simultaneously (Vaidya, Paragraph 1).

9. Claims 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Desikan/DeBrosse et al. combination described above, and further in view of the Butner reference (hereinafter, "Butner").

(A) As per claim 21, Desikan discloses the portable electronic device of claim 20, Desikan does not disclose that the portable electronic device comprises a display. Butner discloses that the portable electronic device comprises a display [...devices such as PDAs and cell phones will require the dense, fast, relatively inexpensive nonvolatile memory that MRAM can provide]

(B) As per claim 22, Desikan and Butner disclose the portable electronic device of claim 20, wherein the portable electronic device is one of a personal digital assistant, a cellular telephone, a digital music player, a personal organizer, and a digital camera [Butner, ...devices such as PDAs and cell phones will require the dense, fast, relatively inexpensive nonvolatile memory that MRAM can provide].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the portable device of Butner into the Desikan/DeBrosse et al. combination described above, since this would allow for dense, fast, relatively inexpensive nonvolatile memory that such devices require (Butner, Setting the standard).



***Response to Arguments***

10. Applicant's remarks submitted with the amendment filed on May 26, 2006 have been carefully considered, but are not deemed convincing. In particular, the citation from Desikan, Section 3.1, that the MRAM banks "are present in a separate vertical layer above the processor substrate" is not relevant to the claims. The claims require that the MRAM banks be present in the same substrate as the decoder and the ECC, *not* the processor. In fact, it appears that applicant's MRAM banks are separate from the applicant's processor (note Figure 1).

***Conclusion***

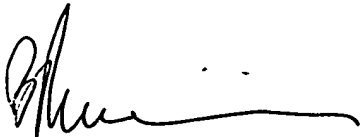
11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James Peikari whose telephone number is (571) 272-4185. The examiner is generally available between 7:00 am and 7:30 pm, EST, Monday through Wednesday, and between 5:30 am and 4:00 pm on Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Reginald Bragdon, can be reached at (571) 272-4204. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center at 866-217-9197 (toll-free).



B. James Peikari  
Primary Examiner  
Art Unit 2189  
8/5/06